Runnymede BOROUGH COUNCIL

2018 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management

January 2020.

Local Authority Officer	Duncan Carins
Department	Environmental Health & Licensing
Address	Civic Centre, Station Road, Addlestone, Surrey KT15 2AH
Telephone	01932 838383
E-mail	duncan.carins@runnymede.gov.uk
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Executive Summary: Air Quality in Our Area

The summary is designed to provide an overview for people who reside and work within the area of Runnymede Borough Council as to the air quality that was present within the Borough during 2018. The report also provides detail of how the issue of air quality is being addressed within the Borough and the intentions of the Council in determining any future action.

The main conclusions of the report are the following; -

1. Air quality within the Borough has generally seen a slow decline in nitrogen dioxide levels across the Borough over the time period that the Council has been monitoring the levels of nitrogen dioxide.
2. When directly comparing the nitrogen dioxide levels of 2017 to 2018, the air quality situation within the Borough has overall seen a slight general improvement year on year in so much that at 13 out of the 28 monitoring points where comparable measures were taken these showed a decrease in levels, 3 sites showed the same levels, and 12 showed the situation being worse than the previous year. Of these 12 sites two are background sites, both showed that there was an overall increase in nitrogen dioxide of around 2 ug/m^3.
3. The levels of nitrogen dioxide are in the main generated by vehicular transport and problems can occur in areas with high volumes of traffic.
4. It was interesting to note that the area which was declared as an extension to the AQMA has shown that over the last 2 years, levels have been below the objective level and hence the Council will consider revoking this AQMA should further results show that this current improvement has been sustained.
5. Further difficulties have been encountered with the “watching brief” in relation to an area adjacent to a road junction controlled by traffic lights in Chertsey due to the fact that during 2018 there was a spate of diffusion tubes going missing, prior to collection. However, it was decided to move some of the tubes to less prominent positions and also slightly raise the height of the other tubes to make the unauthorised removal more difficult. Following the introduction of these measures, it appears that this has helped to improve the security of the tubes.
6. In 2018, there were 2 monitoring locations within the Borough where annual average nitrogen dioxide levels exceeded the national air quality objective of 40µg/m^3. One being at the centre of Addlestone within the AQMA the other being

adjacent to the Runnymede Roundabout (Egham A30/ M25) where there had been major road works to the roundabout which lasted a year (August 2017 to July 2018). These road works regularly caused major traffic congestion in the area. The results from a diffusion tube closely located to the area indicated that the level, from one year to the next, showed an increased from 34 to 42 ug/m^3 and hence it is likely that the congestion caused by the roundabout improvement works resulted in an overall increase of nitrogen dioxide of around 25%.

7. RBC continues to work in close collaboration with our colleagues at Surrey County Council within such networks as the Surrey Air Alliance (SAA).

Air Quality in Runnymede Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion.

Previous Reviews and Assessments within Runnymede Borough Council have concluded that concentrations of carbon monoxide, benzene, 1,3-butadiene, lead, sulphur dioxide and PM_{10} are compliant with the relevant national and European objectives.

Air Quality Management Areas (AQMAs) have however been declared at two locations in Runnymede Borough Council for exceedances of the annual mean nitrogen dioxide objective, namely land adjacent to the M25 and at a traffic light-controlled junction in Addlestone town centre.

Details of the current AQMA can be found on the Defra UK Air website (www.uk-air.defra.gov.uk) or via the following link: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=26 .
The highways authorities for Runnymede are Highways England for the major strategic network roads (M25, M3) and Surrey County Council (SCC) for the other roads within the Borough. The SCC Local Transport Plan (LTP3) includes a number

of supporting strategies including the Surrey Air Quality Strategy and the Surrey Climate Change Strategy.

The aim of the air quality strategy is to improve air quality in Air Quality Management Areas (AQMAs) on the county road network such that Surrey's borough and districts are able to undeclared these areas as soon as possible

M25

Monitoring carried out in 2013/2014 confirmed that nitrogen dioxide concentrations adjacent to the M25 AQMAs in Egham at the Pooley Green railway level-crossing were above the air quality objective at relevant locations and as a result the M25's AQMA was extended to include the area near to the level-crossing. Hence in 2015 the department's available resource for air quality at that time was dedicated to declaring an extension of the AQMA to include the area adjacent to the crossing. It has been noted from the latest annual monitoring results that the levels of nitrogen dioxide within this area have now fallen below the objective levels and as a result if these levels are found to consistently be maintained below the objective then the declared 2015 extended AQMA should be revoked.

Addlestone

There is an area associated with a four-way traffic light-controlled junction in Addlestone town centre which has been declared an AQMA. The general trend indicates a decrease in nitrogen dioxide concentrations, to below objective levels, at locations that are located further away from the central point where the traffic lights are located. However, it is interesting to note that the area immediately adjacent to the traffic light-controlled junction at the centre of the AQMA, where there is a monitor located on the façade of a residential premise, this location continues to indicate a level above the air quality objectives. In terms of the levels found at this location for 2018 when compared to 2017 the level for 2018 have shown a reduction of 3.2µg/m^3 over the previous year however this reduction brings it down to the levels found two years ago**.**

A photograph has been provided which depicts the proximity of the diffusion tube to the façade of the building at the traffic light-controlled junction to provide an indication of the type of situation that is encountered with properties directly abutting the footway.

Picture 1 AQMA Addlestone traffic light junction – tube location

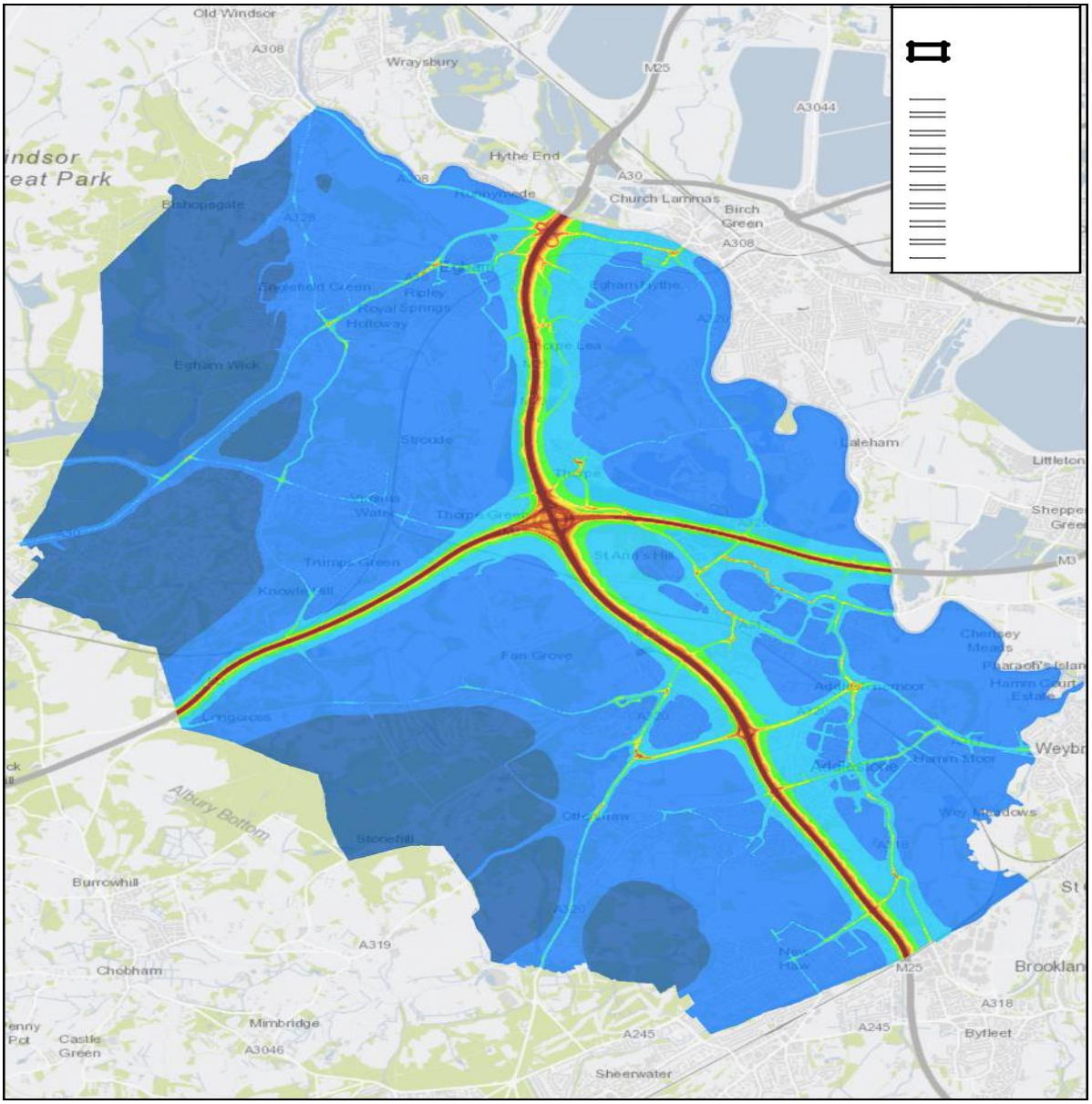
Investigation for a potential AQMA at Chertsey

At a busy roadside junction controlled by traffic lights in Chertsey it has been shown that there were exceedances in the air quality objective at the kerbside, however once distance correction factors were applied then the levels at the closest residential facades were within the objective limits. The Council is attempting to keep a “watching brief” at this site however the diffusion tubes which are put up on a monthly basis often go missing. As a result, measures were taken such as moving the monitors slightly higher or placing them in a less prominent position and it appears that these measures have helped in providing more reliable returns of the diffusion tubes. However, it should be reported that with tubes going missing this has in itself produced difficulties in the attempts to keep a watching brief in relation to providing an accurate picture of the levels of nitrogen dioxide within this particular area.

Source of Air Pollution

Road;- Modelling of annual nitrogen dioxide levels shows the influence of road traffic on levels across the Borough, with major trunk routes such as the M25 and M3 motorways. Modelling was undertaken in association with the Council's planning department in relation to the emerging Local Plan. Further air quality modelling work has been commissioned on a County wide scale by Surrey Air Alliance.

Runnymede's modelling exercise was based on road traffic information for 2015. The modelling was done in order to consider proposed traffic pollution with regards to the future areas of development. This information was submitted to the Planning Inspector as evidence for the emerging Local Plan. The actual modelling work was undertaken by Cambridge Environmental Research consultants (CERC). See below; Map of the Bourgh which depicts nitrogen dioxide levels.



It is abundantly clear from the modelling work that the main sources of nitrogen dioxides emanate from the road networks.

Runnymede also continues to support Surrey Air Alliance (SAA), a working group of air quality officers from across the Surrey districts and boroughs, which is also attended by officers from Surrey County Council and Surrey Public Health. Further air quality modelling work was commissioned by SAA and its envisaged that further modelling work will be considered in subsequent reports.

Aircraft; Heathrow Airport expansion

Heathrow southern runway is at its nearest point some 4km from the boundary of Runnymede Borough Council. At the end of June 2018, Parliament voted to pass the Airports National Policy Statement, new policy that sets out the criteria under which consent will be given for expansion of the airport. Since 2018 there have been ongoing discussions surrounding the expansion of Heathrow. Heathrow Airport Ltd is consulting on its proposal to expand the airport through construction of a third runway, new terminal capacity and other supporting infrastructure. It is envisaged that if Heathrow manages to obtain development consent, construction of the new runway and associated infrastructure would begin soon after the approval.

The proposed new runway would be to the north of the existing runways i.e. further away from Runnymede Borough Council's boundary.

In terms of air quality and over-flights within the Borough, according to information from DEFRA that once an aircraft reaches an altitude of greater then 450m than the on-ground contribution to air quality from aircraft overhead would be negligible. Hence, in terms of aircraft taking off from Heathrow airport, using the preferred routes and maintaining the required climb gradient then it is expected that aircraft would be above 450m height when entering into air-space above the Borough and hence would produce negligible, direct, on ground air quality issues in relation to the current applicable air quality standards.

In should be noted that it has been suggested that there is to be a privately funded Heathrow Southern Railway line associated with an expanded Heathrow. The proposed route of the new railway line would take it from the southern boundary to the northern boundary of the Borough.

Major projects for consideration

1. Heathrow expansion
2. South West railway line (in support of a potentially expanded Heathrow)

https://www.gov.uk/government/news/new-heathrow-rail-link-to-lead-the-way-for-future-transport-funding-schemes/

3. Southampton to London Pipeline – Esso are proposing to replace 56 miles of the 65-mile Southampton to London Pipeline. The existing underground pipeline enters into the Borough at Longcross and leaves the Borough at Chertsey where it crosses the River Thames. The preferred route of the new pipeline was consulted on in Autumn 2018, and a Development Consent Order application was made in June 2019. If consented the project could start in 2022.

https://infrastructure.planninginspectorate.gov.uk/projects/south-east/southampton-to-london-pipeline-project/

4. Thames flood water relief scheme. Major engineering works at the River Thames in order to provide a series of measure that will help protect residents within the Borough from flooding.

Actions to Improve Air Quality

- Consideration of how to improve air quality have been included in the Council's approved Air Quality Action Plan and this includes a raft of measures such as consideration for planning applications within or near the Borough's AQMA. Many planning applications have had conditions in relation to air quality requirements due to the fact that the development was close to or within a defined AQMA. For the full range of measures see Runnymede's Air Quality Action Plan.
- Runnymede Borough Council monitors local air quality through an extensive diffusion tube monitoring network within the Borough.
- Runnymede Borough Council, together with the other ten Surrey Local Authorities and representatives from Surrey County Council (Public Health and Transport) have established the SAA Group which aims to coordinate certain actions to reduce air pollution within Surrey. The group has

commissioning a modelling exercise of air pollution with emphasis on nitrogen dioxide and particulate matter.

- Emerging Local Plan.

In order to meet the Borough's development needs and growth opportunities then the Local Planning Authority has to have in place a Local Plan. Currently there is an emerging new Local Plan being prepared and air quality is a related consideration. As a result, air quality modelling work was commissioned in 2018 in relation to the proposals within the emerging plan in order to understand the potential impact that the policies and plans of the emerging Local Plan would have on air quality.

- Schools Project.

In Spring 2018, the SAA)consortium was awarded £145,188 from the Defra's AQ Grant Fund to run an engagement and behaviour change programme at up to 40 schools across Surrey near to an AQMA.

The project has run throughout the 2018/19 academic year and some activities will continue into the 2019/20 academic year following several District/ Borough Councils, including Runneymede each providing £7000 to ensure that the programme continued. The objective of the project was to give school children an increased awareness of the health impacts of poor air quality and where the Air Quality Management Areas are near their school, to understand what they could do to improve local air quality and reduce exposure, and ultimately to change behaviour.

A total of 7 schools in Runnymede have benefitted from taking part in one or more of the following measures that were on offer:

- 6 schools in Runnymede held a performance of a bespoke theatrical production on air quality and sustainable travel;
- 5 schools in Runnymede took part in workshops and whole school assemblies run by a specialist contractor. The workshops included practical exercises in exposing nitrogen dioxide diffusion tubes to investigate pollutant levels with distance from school drop-off zones;
- One school in Runnymede hosted an anti-idling awareness event during the school run; and
- Over 2600 pupils across the County received additional subsidised cycle training

- Electric Vehicle Charging

In November 2018, SCC adopted an Electric Vehicle Strategy setting out how SCC will support and promote the uptake of electric vehicles in Surrey. Surrey is an area that is well-suited to adopting electric vehicles. There also is a trial charging point project which is due to commence soon in order to ascertain the feasibility of providing on-street charging facilities. The pilot project will be trialled in 4 Boroughs within the County. Once the results of the pilot are assessed then SCC will bring forward further strategies as to what SCC intend to do with regards to charging provisions.

Conclusions and Priorities

Overall there appears to be encouraging signs that the levels of nitrogen dioxide within the Borough and most notably within the AQMAs are slowly reducing. That being the case then if these gains show consistent evidence of remaining below the objective level then the Council would look to revise the areas of the declared AQMAs. In addition to the overall national trend there is sterling work being undertaken across the County due to the concerted effort of the SAA in such areas as schools air quality projects. This schools project is being further sponsored by Runnymede Borough Council. Further to the SAA work then Runnymede Borough Council have also made a bid to Defra for funding for an educational campaign to try to change drivers' behaviours toward switching their engines off at level crossings. Runnymede Council has also joined the Air Alert scheme and hence provides this valuable service to people who have a need to know about poor air quality days.

Local Engagement and How to get Involved

There is continual interest in air quality locally from Councillors, consultants, residents' groups and individual residents. Information is displayed on the Councils web site to promote special events such as clean air week and Air Alert. Information such as the following;-

- Clean air week

As most air pollution of concern in the district is related to traffic, there are some easy changes we can make to all do our bit to reduce emissions:

1. Do you need to take the car? – consider alternatives to using your car; public transport, walking or cycling will help reduce emissions. For timetables, guides and maps visit the Travel Smart in Surrey website;-

   www.travelsmartsurrey.info/. There is also information there on car sharing and car clubs.

   Research has indicated that levels of air quality pollutants inside vehicles, even with the windows shut, can lead to higher exposure than pedestrians and cyclists on the same streets. So by walking or cycling you could reduce your exposure and improve your fitness and health.

2. Need to take the car? – Think about how you drive. Small changes improving your driving style can save lots of fuel, significantly reduce wear and tear, and improve the life of your vehicle:

   - Regular maintenance improves fuel efficiency by as much as 10% plus underinflated tyres increase rolling resistance, further increasing fuel consumption;
   - Reduce excess weight and wind resistance (caused by roof racks, open windows and boot clutter);
   - Reduce engine idling – a modern engine is designed to be used 'from cold'. Warming up an engine whilst stationary wastes fuel and leads to undue engine wear;
   - Avoid aggressive acceleration and braking – aggressive driving can raise fuel consumption by 37%;

- Change up gears as soon as possible;

- Review trip data after a journey to learn how to improve driving style, or to reinforce eco-driving lessons already learnt. A number of apps and satnavs can help with this. Only use such tools when it is safe and legal to do so.

3. Thinking about changing your car or van? – consider an ultra-low emission vehicle such as a plug-in electric or hybrid vehicle. More options are becoming available each year, technology is improving the range of vehicles, running and servicing costs are much lower, and grants are available to help towards their purchase. For example, a grant is currently available to cover up to 35% of the costs of a car, up to a maximum of either £2,500 or £4,500 depending on the model (or 20% of the cost of a van, up to a maximum of £8,000). Find out more on the .GOV website: https://www.gov.uk/plug-in-car-vangrants/what-youll-get . There are over 30 eligible models of vehicles from all the major car manufacturers including BMW, Citroen, Ford, Kia, Mercedes, Nissan, Peugeot, Renault, Tesla, Toyota and Volkswagen. The vast majority of electric vehicle charging takes place at home, and there is also currently a grant of a 75% contribution towards the cost of a home charge-point up to a maximum of £500.

- Air Alert

  The Council has recently subscribed to Air Alert and has invited people suffering from asthma, chronic obstructive pulmonary disease (COPD) or a respiratory condition to sign-up for AirAlert, a free service provided by the Council to help those with respiratory conditions manage their health when air quality is poor. While air pollution levels in Runnymede are generally "*Low*", on ~20 days per year pollution levels are reached that are capable of causing short term health symptoms for people with pre-existing respiratory conditions.

  People who register for the free service receive an email, text or voicemail message, informing them the day before of an expected elevation of air pollution in their area. This enables them to make choices about what they do and how they manage their medication, so they can stay in control of their own health.

Health advice in the AirAlert message is approved by UK experts and varies according to a simple air pollution index (low, moderate, high and very high). The index is based on the levels of five pollutants (nitrogen dioxide, sulphur dioxide, ozone, carbon monoxide and particles). For more information on the AirAlert service visit www.airalert.info/Surrey to register. For residents without internet access, please phone 01784 446 251 to sign up.

A survey of AirAlert users showed that 88% of survey respondents found AirAlert a useful or very useful service, and two thirds had recommended it to someone else. They found the service helped them manage their symptoms and reduce their exposure to air pollution. They also reported increased confidence to participate in social and recreational activities.

In addition to the phone/ email service, users of airAlert and any other interested resident can also download the airAlert app to a Smartphone (android and iOS) from Google Play or the App Store.

It is envisaged that Air Alert will be a valuable addition to the promulgation of information to a receptive audience.

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1 Local Air Quality Management

This report provides an overview of air quality in Runnymede Borough Council during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Runnymede Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

AQMAs are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Runnymede Borough Council can be found in Table 2.1.Further information related to declared AQMAs, including maps of AQMA boundaries are available within this report see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s). It should be noted that following the declaration of AQMAs then there is an air quality action plan put in place to ensure that there are measures in place which seek to reduce levels to be consistently below the air quality objectives. It is suggested that once all the Borough wide air quality modelling work is completed then this will provide invaluable data in order to review areas adjacent to the M25. The AQMA within Addlestone has over the last few years shown slight decreases in levels of nitrogen dioxide at the measuring locations and there are a few monitors within the AQMA which are indicating levels below 40 µg/m^3 and hence the area is making steady progress toward achieving levels below the objective. It is however interesting to note that in 2018 the level of nitrogen dioxide in and around the actual location of the traffic lights still shows an increase in levels above the objective levels. Nevertheless, once there is confidence that levels below the objective are being achieved then steps will be taken to revoke the Addlestone AQMA.

In terms of the most recently declared extension of the AQMA at the level crossing in Egham then the results pertaining to this area show that levels of nitrogen dioxide were below the objectives for 2018. However, some of the results have been obtained following annulisation of the missing data and as a result it will be interesting to discover if the following years show such a consistent decease in levels of nitrogen dioxide.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
AQMA M25	Declared 3/12/2001 Amended 20/10/2015	NO_2 annual mean	Runnymede	Entire length of M25 within the Borough and an extended area in December 2016 to include area in Egham near to railway crossing .	Yes	unknown		Greater than 40 at some locations	µg/m^3	Runnymede approved air quality action plan	April 2014	https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0
AQMA Addlestone town	Declared 4/7/2008	NO_2 annual mean	Addlestone	Addlestone town centre traffic light 4 way junction- Brighton Road/Church Road/ Station Road/High Street	No	59	µg/m^3	46	µg/m^3	Runnymede approved air quality action plan	April 2014	https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0

☒ Runnymede Borough Council **confirms the information on UK-Air regarding their AQMA(s) is up to date.**

2.2 Progress and Impact of Measures to address Air Quality in Runnymede Borough Council

Defra acknowledged the receipt of last year's ASR however there was no appraisal or further comment made in relation to the content of the report.

Runnymede Borough Council has taken forward issues that were detailed within previous years reports in pursuit of improving local air quality. Details of measures completed, in progress or planned are set out in Table 2.2.

More precise details on these measures can be found within the Council's Air Quality Action Plan 2014;-see

https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0

Key completed measures are:

- Consider planning applications near to or within the designated AQMAs to ensure that suitable measures are adopted in relation to air quality
- Supporting SCC with plans and funding bids to assist with improving air quality within the Borough
- Maintain a strong presence within Surrey Air Alliance group
- Three hydrogen refuelling stations located nearby; Cobham Motorway Services, Weybridge and Teddington, hence Runnymede Council is well placed to promote hydrogen fuel cell vehicles due to the availability of hydrogen within the area

Progress on the following measures has been slower than expected in relation to;-

- Highway infrastructure improvements – Liaison with agencies with responsibilities for transportation networks within AQMAs to deal with ;--
  (i) improving the road layout and flow of traffic within AQMA.
  (ii) ensuring that any temporary road works to roads adjacent or within the AQMA's have strict conditions applied to any permit to minimise additional congestion within the AQMA.
- Attempted to maintain a close "watching brief" on the nitrogen dioxide levels at Bridge Road /Weir Road Chertsey but has been hampered due to missing tubes.

- Modelling exercise of target pollutant levels to be carried out in association with the SAA(to include PM_{10}, $PM_{2.5}$ & NO_2).
- Consider unification of an emissions policy for taxi licencing within all of Surrey to ensure continuity of approach to this matter.
- Joining the AirAlert scheme.
- Cut engine signage - application to Defra for grant aid.
- Surrey Schools Air Quality Programme.

In Spring 2018, the SAA consortium obtained £145,188 from the Defra AQ Grant Fund to run an engagement and behaviour change programme at up to 40 schools across Surrey within 2km of an Air Quality Management Area.
The project has run throughout the 2018/19 academic year and some activities will continue into the 2019/20 academic year. Since schools were selected which were close to Air Quality Management Areas the aim of the project was to give the pupils attending these school an increased awareness of the health impacts of poor air quality and, to understand what was possible to do to improve local air quality and reduce exposure, and ultimately to change behaviour.

7 schools within Runnymede Borough Council took part in one or more of the measures on offer, which included:

- Media Campaign – a multi-media campaign using bespoke positive messages (see Figure 2.1) aimed at primary school children and their parents that ran for 5 weeks just after the start of the 2018/19 academic year using posters on bus backs and ad-shells at bus stops, publications such as Primary Times and Surrey Matters, digital media e.g. electronic newsletters, Facebook, Twitter, and radio advertising.
- Theatre in Education – A bespoke theatre production designed for year 5 pupils to raise awareness of the health issues associated with poor air quality. The drama production also explored sustainable modes of transport.
- Bikeability Learn to Ride – subsidised scheme (on top of the cycle training already offered by Surrey County Council) to help over 2,500 trainee pupils ride without stabilisers.

- School Lessons and resources – a specialist provider produced toolkits and resources for both Primary and Secondary Schools and delivered workshops and whole school assemblies at over 30 schools across Surrey. The workshops included practical exercises in exposing nitrogen dioxide diffusion tubes to investigate pollutant levels with distance from school drop-off zones.
- Modeshift Stars – extra assistance to schools to help them gain accreditation under the ModeShift Stars scheme

The programme hosts an Air Quality Summit to further disseminate the messages and successes of the project across school representatives from across the County. The Summit will be a networking opportunity for Eco Co-ordinators from schools across the county. Workshops and presentations will be provided by the London Sustainability Exchange on their school workshops and resource toolkits; a research fellow from the University of Surrey's Global Centre for Clean Air Research; a showcase school from the programme on their experiences; Living Streets and the SAA air quality modelling work.

In June each year Surrey County Council host a sustainable travel challenge called the Golden Boot. As part of the air quality schools programme it is proposed to include an air quality theme to the challenge, with a rebrand and upgrade. A Green Boot challenge will be introduced since it will be a more accessible scheme than the Golden Boot scheme. However, it is perceived that if the Green Boot scheme is a success then schools may go onto undertake the Golden Boot challenge.

With respect to the media campaign:

- There were over 16,000 views on the webpage making it the most viewed page on the Healthy Surrey website during the campaign period.
- Facebook was the most popular social media channel to reach and engage with parents. There were 41 Facebook posts during the campaign period which appeared 98,970 times, generated 1,253 link clicks and 600 engagements, such as comments, shares and likes.

- On Twitter, 54 posts appeared a total of 73,551 times with 193 engagements.
- Instagram posts and stories were used to engage with residents. They reached 3,306 people and around 250 engaged with content.
- Google advertisements were shown to parents in Surrey and generated 16,052 clicks through to the webpage.

Early feedback on the success of the campaign:

> "Despite low awareness, the campaign has performed strongly: it is strongly liked, conveys new information, and is felt to discourage people from using their cars on the school run. The campaign scores very highly in terms of relevance, impact, clarity and information. It is also significantly more engaging than other campaigns (strong positive engagement, but low negative engagement). This all implies that the relatively low awareness is due to the low campaign spend, not any weakness in the creative executions."

This indicates that the creative design work will be evaluated strongly and that despite a low budget spend the campaign did successfully engage with residents of Surrey.

The successful Theatre in Education supplier, Performance in Education (PiE), developed a bespoke production on air quality: Abby Aire and the Shed of Science. The performance toured around 40 schools around Surrey from 12 November 2018 to 7 December 2018 with audiences totalling 2,156 year 5 students (age 9/10 year olds). A total of 6 schools in Runnymede Borough Council held Theatre performances.

Evaluation feedback of the Theatre activity indicted that 100% of 76 teaching staff surveyed thought the show was an effective or very effective way to communicate what causes poor air quality, how it impacts on health and what pupils can do to help improve the air quality around their school. The pupils were exposed to key terminology and vocabulary and were able to identify modes of transport which cause pollution.

Across Surrey, 31 schools have taken part in workshops and school assemblies provided by the specialist provider London Sustainability Exchange (LSx), equating to a total of 7,435 pupils. Tool kits and teaching resources were prepared and distributed to all schools in Surrey. 5 schools in Runnymede Borough Council took part in the workshops and school assemblies.
1 school within Runnymede Borough Council area hosted an anti-idling event.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Runnymede Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of the AQMAs within the borough.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Air Quality Action Plan produced and approved by committee	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Runnymede Borough Council		2014	AQAP published			2014	County with 2 tier authority
2	Established Surrey Air Alliance Group coordinating programmes to develop area wide strategies to reduce emissions and improve air quality	Policy Guidance and Development Control	Regional Groups	Surrey County Council and Surrey Local Authorities	2016	2016 Formation of group				Ongoing	
3	Permitted premises	Environmental Permits	Other measure through permit systems & economic instruments	Runnymede Borough Council			Ensuring that all permitted process operate within control limits			Ongoing	

4	Encourage adoption minimum emissions standards into taxi licensing procedures	Promoting Low Emission Transport	Taxi Licensing conditions/incentives	Runnymede Borough Council	2016	2018/19	Reduce tailpipe emissions in AQMA	yes	Air Quality officers representing the borough/district councils have suggested taxi licencing authorities for County wide policy on emissions.	2018	
5	Use of Planning regime to incorporate measures to reduce air pollution	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Runnymede Borough Council	2015			Air quality included in Development Planning			Ongoing
6	County and Borough modelling of key pollutants	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Surrey Air Alliance group	2016	2018	Modelling completed		Estimates obtained-tendering process to be followed	2017/18	
7	Support of bid to DEFRA re emission at schools	Promoting Low Emission Transport	Other	Surrey County Council and Surrey Local Authorities	2017	2017	Awareness raising			2018	
8	Bid to defra for – erecting of large format signs on lampposts close to level crossing – switch off engines	Public information	Via other mechanisms	Runnymede BC	2018/19	2020	Signage erected	yes		ongoing	
9	Emerging Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Runnymede BC	2015	2018	Local Plan approved.		Central Government to consider	2018	ongoing

10	Reducing Emissions – School and Business Travel Plans: Golden Boot Challenge	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	Surrey County Council		Ongoing	Reduced dependency on car use for school journeys and number of people taking part in the scheme		Annual challenge for schools to increase the % of pupils walking, cycling, scooting / skateboarding, using public transport, car sharing or park-n-striding to school.	ongoing	Golden Boot to be rebranded to AQ theme in Oct 2019 as part of Schools AQ programme
11	Reducing Emissions from Council Activities	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Runnymede BC		ongoing	Decreased emissions from council owned fleet		New Council fleet now EuroVI.Abilty to burn biofuels – no biofuel tank to be installed in council depot	2020	**progress on zero emission vehicle to be considered when current fleet lease expires in 2025**
12	Air alert	Public Information	via other mechanisms	Runnymede BC		2019	Uptake by residents, Reduced hospital admissions		subscribed	2020	Scheme operated by collaboration of Surrey LAs. Continuance relies upon co-funding of other LAs

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$(particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Runnymede Borough Council is taking the following measures to address $PM_{2.5}$: As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$(particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Given the recent implementation of the Technical Guidance LAQM.TG16 and Policy Guidance LAQM.PG16, Runnymede Borough Council is working towards defining a strategy to reduce emissions or concentration of $PM_{2.5}$. This work is being undertaken in close association with the Director of Public Health at Surrey County Council. It is further expected that the modelling exercises being promulgated will provide incisive and key information on $PM_{2.5}$ to assist with the production of a suitable strategy.

However, existing measures to improve air quality already in place can help reduce levels of $PM_{2.5}$, such as:

- Promoting driver awareness such as prevention of idling vehicles.
- Promoting low emission transport and provision of charging points and hydrogen refilling stations.
- Surrey County Council's Transportation plans and strategies.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Runnymede Borough Council did not undertake any automatic (continuous) monitoring within the Borough during 2018 nor is it planning to introduce continuous monitoring within the foreseeable future.

3.1.2 Non-Automatic Monitoring Sites

Runnymede Borough Council undertook non- automatic (passive) monitoring of NO_2 at 32 sites during 2018 using diffusion tubes as supplied by Lambeth Scientific Services. Table A.1.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites within the AQMAs and elsewhere in the Borough are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment considerations for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

It should be noted that the air quality monitoring results presented in this section are, where relevant, adjusted for bias and distance correction. “Annualisation” of the areas where sampling collection data was below 75% was undertaken. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

Table A.22 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m^3.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

Since Runnymede Borough Council do not have any continuous monitors then it is difficult to directly consider in detail the nitrogen dioxide hourly mean concentrations . The hourly mean air quality objective of 200 µg/m^3, is not to be exceeded more than 18 times per year. However, a comparison between the hourly objective and the annual mean objective can be made. It is understood that an **annual mean** of greater than than 60µg/m^3, provides an indication that an exceedence of the 1-hour mean objective could be likely at these sites.

Consideration of relevant exceedances

In 2018, following bias correction of the raw data and the application of distance correction, this showed two locations in the Borough where there were exceedances of the annual mean objective. See table 3.1 below.

Table3.1 – Annual exceedances

Site number	Reading - bias corrected	Distance correction
RY14	45.5	45.5
RY33	34.5	42.7

RY14 being at the centre of Addlestone within the AQMA the other site RY33 being adjacent to the Runnymede Roundabout (Egham A30/ M25) where there had been major road works to the roundabout which lasted a year (August 17 to July 18)

resulting in major congestion in the area as a direct result of these road works. The results from a diffusion tube closely located to the area indicated that the level from one year to the next, showed an increased from 34 to 42 ug/m^3 and hence it is likely that the congestion caused by the roundabout improvement works resulted in an overall increase of nitrogen dioxide of around 25%.

It is noted that for the hourly objective to be exceeded then the annual mean would have to exceed 60µg/m^3. **No site** within the Borough had an annual mean greater than 60µg/m^3. **Hence there are no sites which exceed the hourly objective limit**. However, it is considered prudent to have a look at actual monthly results which exceed 60µg/m^3. (See table 3.2.). There were only 2 results that exceeded 60 µg/m^3. These being at the traffic lights at Weir Road and Bridge Street (results 63 µg/$m^3$and 59µg/m^3). last year there were 9 measured monthly concentrations greater than the equivalent bias corrected levels of 60µg/m^3 . Since the figure of 1.04 has been used as a bias correction for 2018 then this equates to an unbiased correct figure of greater than >58µg/m^3(58 x1.04 = 60). It should be noted that all these individual **monthly** exceedances greater than 60 µg/m^3occurred during the colder weather periods when weather conditions are such that tend to cause an increase in nitrogen dioxide levels. These values occurred very adjacent to a road within an area where there is a “watching brief” in that should the air quality deteriorate then an AQMA would be declared.

When generally comparing the nitrogen dioxide levels of 2018 (bias corrected) to 2017 (bias corrected) the air quality situation within the Borough has overall seen a slight general improvement year on year in so much that at 13 out of the 28 monitoring points where comparable measures were taken these showed a decrease in levels, 3 sites showed that same levels, and 12 showed the situation being worse that the previous year. Of these 12 sites two are background sites both showed that there was an overall increase in nitrogen dioxide of around 2 ug/m^3.

From the graphs produced in Appendix A, then these depict that over the past 8 years, between 2011 and 2018, concentrations tend to show a slight overall decreasing trend. Nevertheless, it is interesting to consider site RY14 located in the AQMA in Addlestone that has been monitored over the last 8 years which shows that the levels of nitrogen dioxide at the central point where the traffic lights are located returned to levels found 2 years ago and but remains ~20% above the objective level.

3.2.2 Particulate Matter (PM_{10})

PM_{10} is not currently monitored within the Runnymede Borough Council area. However, modelling work for levels of particulate matter within the Borough has ascertained that particulate matter levels do not exceed air quality objectives.

3.2.3 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ is not currently monitored within the Runnymede Borough Council area. However, modelling work for levels of particulate matter within the Borough has ascertained that particulate matter levels do not exceed current air quality target levels.

3.2.4 Sulphur Dioxide (SO_2)

Sulphur dioxide is not currently monitored within the Runnymede Borough Council area and it has previously been established that levels of sulphur dioxide do not exceed air quality objectives.

Appendix A:MonitoringResults

Table A.1–Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
RY1	Civic Centre, Station Road, Addlestone	Roadside	X 505065	Y 164610	NO2	Y	8	3	N	2.3
RY4	Riverside ,Pitson Close, Addlestone	Urban B/G	X 505727	Y 164624	NO2	N	43	43	N	2.0
RY8	Ongar Place First School, Milton Road, Addlestone	Suburban (near to M25)	X 504309	Y 163952	NO2	Y	28	21	N	1.9
RY14	1 High Street, Addlestone	Roadside	X 504991	Y 164601	NO2	Y	2	2	N	2.3
RY19	78 Woodham Lane, New Haw	Roadside	X 505223	Y162698	NO2	Y	11	3	N	2
RY21	London Street/Heriot Rd Chertsey	Roadside	X 504261	Y 166945	NO2	N	3	1	N	2
RY23	37 Bridge Rd, Chertsey	Roadside	X 504888	Y 166786	NO2	N	15	1	N	2.2

RY25	1 Pooley Green Rd, Egham	Roadside	X 501746	Y 171347	NO2	Y	23	12	N	2.4
RY26	19, Vicarage Road, Egham	Roadside	X 501707	Y 171391	NO2	Y	9	2	N	2.3
RY33	46 The Avenue, Egham	Intermediate (near M25)	X 501679	Y 171676	NO2	Y	6	15	N	2.1
RY39	Chobham Lane, Longcross,	Roadside	X 498859	Y 166225	NO2	N	New house building		N	1.8
RY40	Homewood Park, Stonehill Road	Urban B/G	X 502062	Y 165101	NO2	N	68	68	N	2.5
RY43	New Court Chertsey Road Addlestone	Roadside	X 505000	Y 165303	NO2	N	19	2	N	2.3
RY45	27/29 Weir Rd Chertsey	Roadside Moved	X 504879	Y 166765	NO2	N	6	0.6	N	2.3
RY53	1-22 Wyvern Place, High St, Addlestone	Roadside	X 504967	Y 164924	NO2	N	7	3	N	2.4
RY54	23 Brighton Rd, Addlestone	Roadside	X 505070	Y 164477	NO2	Y	5	2	N	2.3
RY55	158 Station Rd, Addlestone	Roadside	X 505526	Y 164782	NO2	N	3	0.4	N	2.3
RY56	34/36 Bridge Rd Chertsey	Roadside	X 504911	Y 166765	NO2	N	8	1	N	2.3

RY57	29 Bridge Rd, Cherstey	Roadside	X 504834	Y 166814	NO2	N	9	2	N	2.3
RY58	39 Weir Road. Chertsey	Roadside moved	X 504891	Y 166773	NO2	N	16	0.2	N	2.3
RY59	Bus shelter Chertsey Rd Addlestone	Roadside	X 504949	Y 165140	NO2	N	15	3	N	2.3
RY60	Renaissance flats, High Street Addlestone	Roadside	X 504966	Y 164836	NO2	Y	5	3	N	2.4
RY61	Pine Court, Addlestone	Roadside	X 504907	Y 164559	NO2	N	5	2	N	2.4
RY62	26/28 Brighton Road Addlestone	Roadside	X 505078	Y 164527	NO2	Y	5	2	N	2.3
RY63	Garfield Road, (sign) Addlestone	Roadside	X 505250	Y 164390	NO2	N	9	3	N	2.5
RY64	Garfield Road, Hampshire Court Addlestone	Roadside	X 505259	Y 164403	NO2	N	11	0.5	N	2.4
RY65	268 Station Road Addlestone	Roadside	X 505803	Y 165036	NO2	N	12	3	N	2.3
RY66	223 Station Rd, Addlestone	Roadside	X 505704	Y164952	NO2	N	12	2	N	2.3

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.2–Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018(%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3]				
					2014	2015	2016	2017	2018
RY1	Roadside	Diffusion Tube	100	67	35	39	39.5	29.8	30.6
RY4	Urban Background	Diffusion tube	100	100	19.6	19.6	22.7	17.8	20.2
RY8	Roadside	Diffusion Tube	100	84	25.5	35.1	24	20.5	22.5
RY14	Roadside	Diffusion Tube	100	92	**48.2**	**48.6**	**45.6**	**48.7**	**45.5**
RY19	Roadside	Diffusion Tube	100	92	37.3	34.3	33.7	31.5	32.3
RY21	Roadside	Diffusion Tube	100	100	31.5	32.1	35.9	31.5	33.4
RY23	Roadside	Diffusion Tube	100	75	36	**42.2**	**42.5**	33.8	**47.5**
RY25	Roadside	Diffusion Tube	100	100	31.6	28.2	30.6	28.5	33.5
RY26	Roadside	Diffusion Tube	100	100	**53.9**	**41**	**44**	36.7	36.5
RY33	intermediate	Diffusion Tube	100	92	36.6	32.4	30.6	34.1	34.5
RY34	Roadside	Diffusion Tube	100	n/a	31.1	25.1	24.9	22.7	n/a
RY39	Roadside	Diffusion Tube	100	84	26.9	25.1	25.7	23.9	28.4
RY40	Urban background	Diffusion Tube	100	92	17.7	17	16.9	16.5	18.1
RY43	Roadside	Diffusion Tube	100	100	27.4	34.5	35.2	26.7	36.9
RY44	Roadside	Diffusion	100	n/a	15.3	23.3	29.3	25.9	n/a

		Tube							
RY45	Roadside	Diffusion Tube	100	50	31.6	37.2	33.3	32.5	36
RY52	Roadside	Diffusion Tube	100	n/a	31.3	34.	30	31.6	n/a
RY53	Roadside	Diffusion Tube	100	67	38.4	39.2	**41.5**	32.2	35.8
RY54	Roadside	Diffusion Tube	100	100	32.7	36.4	33.4	28.1	29.6
RY55	Roadside	Diffusion Tube	100	84	36.2	35.9	34.1	28.7	32.7
RY56	Roadside	Diffusion Tube	100	50	**48.4**	**48.7**	**49.4**		**40.2**
RY57	Roadside	Diffusion Tube	100	50	31.5	36.7	30.8		30.5
RY58	Roadside	Diffusion Tube	100	75	35.2	33.4	31.7		52
RY59	Roadside	Diffusion Tube	100	100	31.2	34	34	30.3	34.7
RY60	Roadside	Diffusion Tube	100	100	32.6	38.8	36.3	28.9	34.7
RY61	Roadside	Diffusion Tube	100	84			32	30.1	33.3
RY62	Roadside	Diffusion Tube	100	84			32.7	31.3	30
RY63	Roadside	Diffusion Tube	100	84			22.5	30.8	21.6
RY64	Roadside	Diffusion Tube	100	84			25.5	22.4	24.1
RY65	Roadside	Diffusion Tube	100	92			26.1	22.4	26.7
RY66	Roadside	Diffusion Tube	100	92			28.7	22.1	25.2

☒Diffusion tube data has been bias corrected

☒**Annualisation has been conducted where data capture is <75%**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

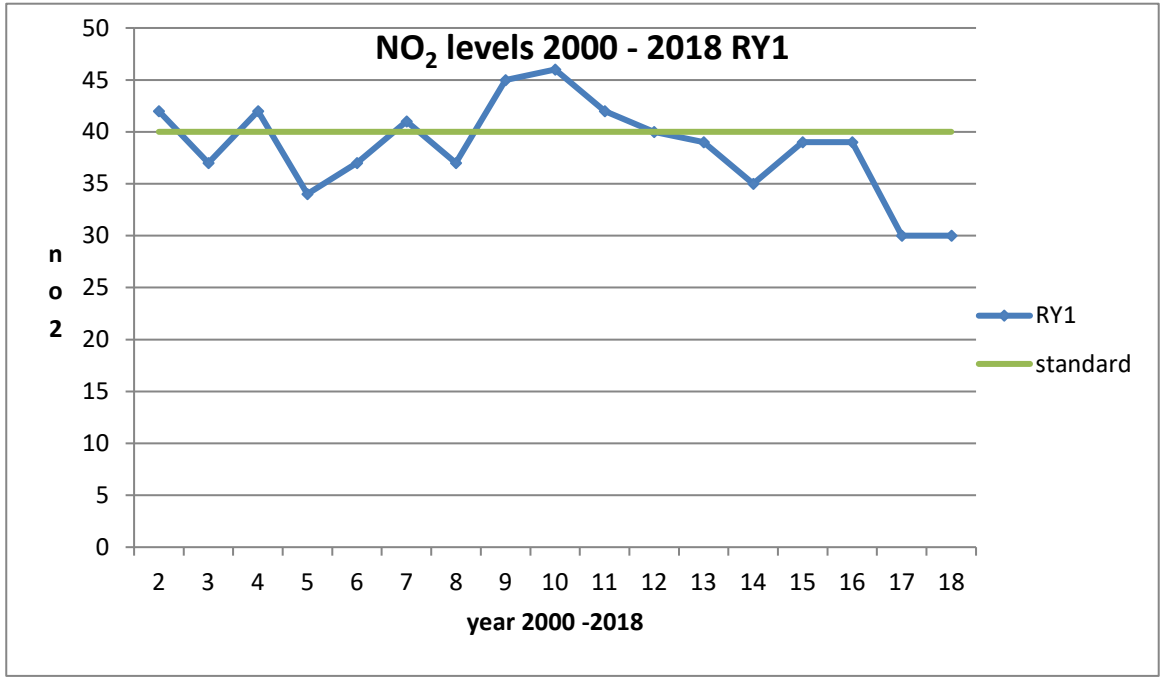
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in**bold and underlined.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

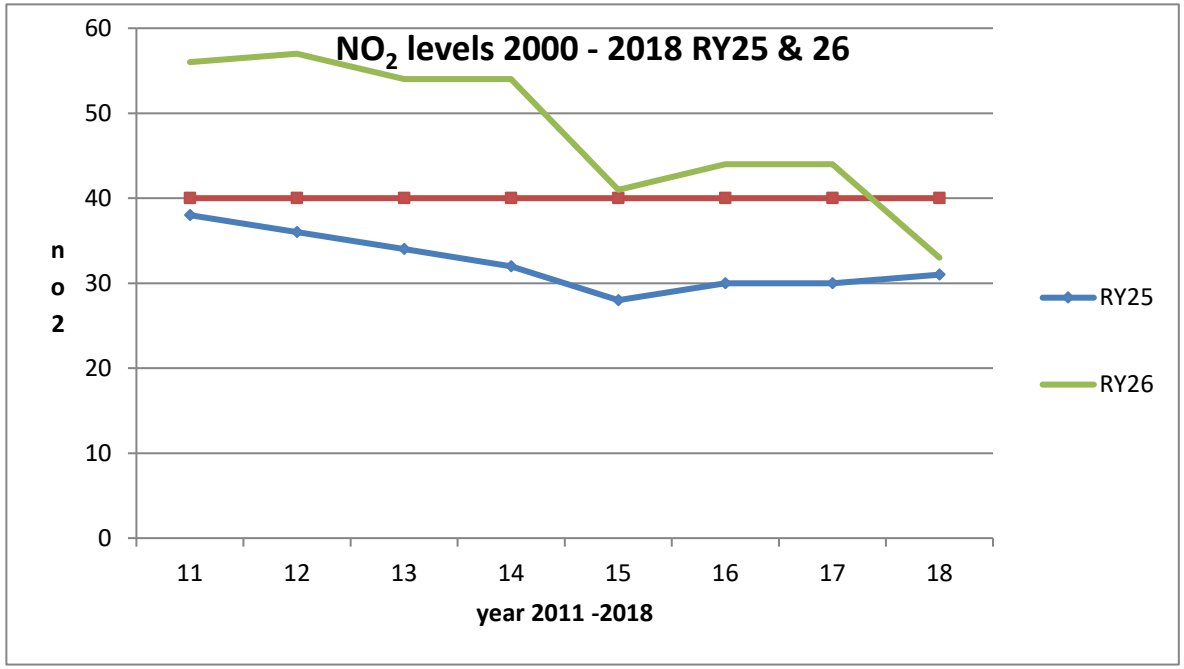
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

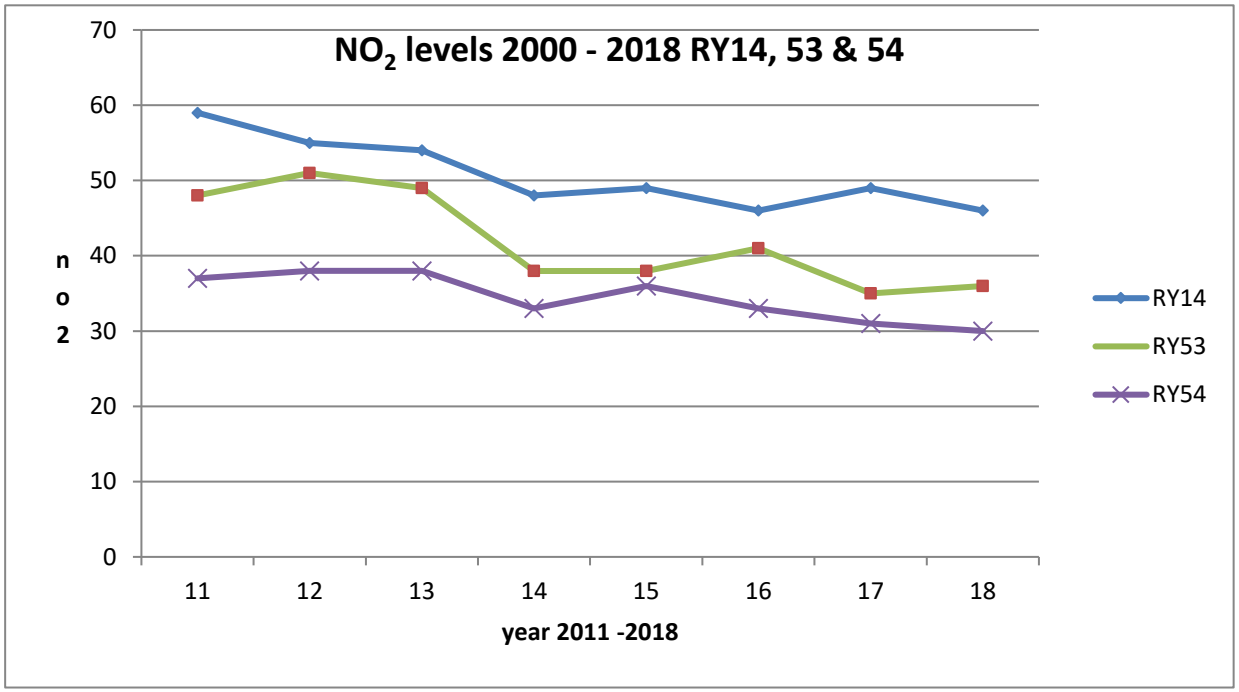
Figure A.1 – Trends in Annual Mean NO_2 Concentrations



Graph sites RY25 and RY26;- Pooley Green level crossing AQMA



Graph of RY14, RY,53& RY54 – Addlestone AQMA



Appendix B:Full Monthly Diffusion Tube Results for2018

Table B.1–NO_2 Monthly Diffusion Tube Results - 2018

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised (1)	Distance Corrected to Nearest Exposure(2)
RY1	30	ns	36	ns	23	24	33	ns	31	22	ns	36	29.4	29.1	25.5
RY4	18	18	22	6	19	13	16	14	18	26	32	31	19.4	20.2	20.2
RY8	23	ns	37	16	18	21	ns	15	16	23	25	22	21.6	22.5	21.3
RY14	**44**	34	**45**	36	ns	39	**54**	**42**	36	**45**	**51**	**56**	**43.8**	**45.5**	**45.5**
RY19	34	28	33	30	ns	32	25	26	ns	31	36	36	31.1	32.3	27
RY21	37	**43**	34	26	30	30	29	23	30	27	35	**41**	32.1	33.4	30.8
RY23	**48**	**49**	**45**	ns	34	35	ns	36	ns	**42**	**59**	**63**	**45.7**	**47.5**	32.2
RY25	29	27	27	21	18	26	30	22	**48**	**40**	**41**	**58**	32.2	33.5	31.3
RY26	39	36	**41**	39	**41**	33	38	36	27	23	32	36	35.1	36.5	32.2
RY33	28	**47**	39	33	33	**41**	31	10	27	33	ns	**43**	33.2	34.5	**42.7**
RY39	30	25	31	ns	27	20	24	ns	29	24	33	30	27.3	28.4	28.4
RY40	18	19	19	14	18	ns	13	31	12	15	15	18	17.4	18.1	18.1
RY43	38	34	**42**	37	21	38	35	39	26	37	35	**44**	35.5	36.9	27.6
RY45	ns	ns	40	ns	ns	ns	ns	21	38	**47**	**47**	**51**	40.7	42.3	29.1
RY53	**43**	31	34	39	25	35	ns	ns	ns	32	35	ns	34.2	35.6	32.8

RY54	32	28	37	24	22	25	29	28	31	26	27	33	28.5	29.6	28.3
RY55	ns	37	42	27	17	26	ns	24	31	36	**37**	38	31.5	32.7	27.8
RY56	**47**	ns	52	ns	ns	ns	ns	ns	**52**	37	**55**	**51**	49	50.9	31.5
RY57	32	ns	**41**	ns	ns	ns	ns	24	ns	**47**	**44**	**46**	39	40.5	26.6
RY58	**54**	**49**	**48**	ns	**42**	ns	ns	**43**	**47**	**56**	**56**	**55**	50	52	30.3
RY59	37	36	36	33	32	33	24	28	32	37	34	39	33.4	34.7	29.6
RY60	34	31	38	32	20	25	31	25	31	38	37	**42**	32	33.3	31.9
RY61	35	25	30	25	25	24	ns	27	32	33	ns	33	28.9	30	28.4
RY62	37	39	32	31	19	21	32	ns	28	34	ns	**43**	31.6	32.8	30.8
RY63	ns	22	21	ns	20	18	17	ns	18	19	19	33	20.8	21.6	21.6
RY64	25	ns	26	18	19	19	22	ns	21	30	21	31	23.2	24.1	23.7
RY65	27	26	25	25	17		ns	21	23	26	33	34	25.7	26.7	25.8
RY66	33	22	31	23	22		17	19	23	30	26	31	25.2	26.2	23

xNational bias adjustment factor used

xAnnualisation has been conducted where data capture is <75%

xWhere applicable, data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in**bold and underlined.**

(1) See Appendix Cfor details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

Appendix C: Supporting Technical Information/Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

Runnymede's diffusion tubes are supplied by Lambeth Scientific Services Limited. 50% triethanolamine (TEA) solution is the absorbent used to prepare the tubes.
The bias adjustment factor applied is a combined bias adjustment factor derived from the national database of co-location studies, available from the LAQM Support Website.
The selection of bias correction factors plays an important part in relation to air quality. Currently there is local debate over the selection of such critical factors. The bias correction factors that have been used since 2000 are produced below in table C.1

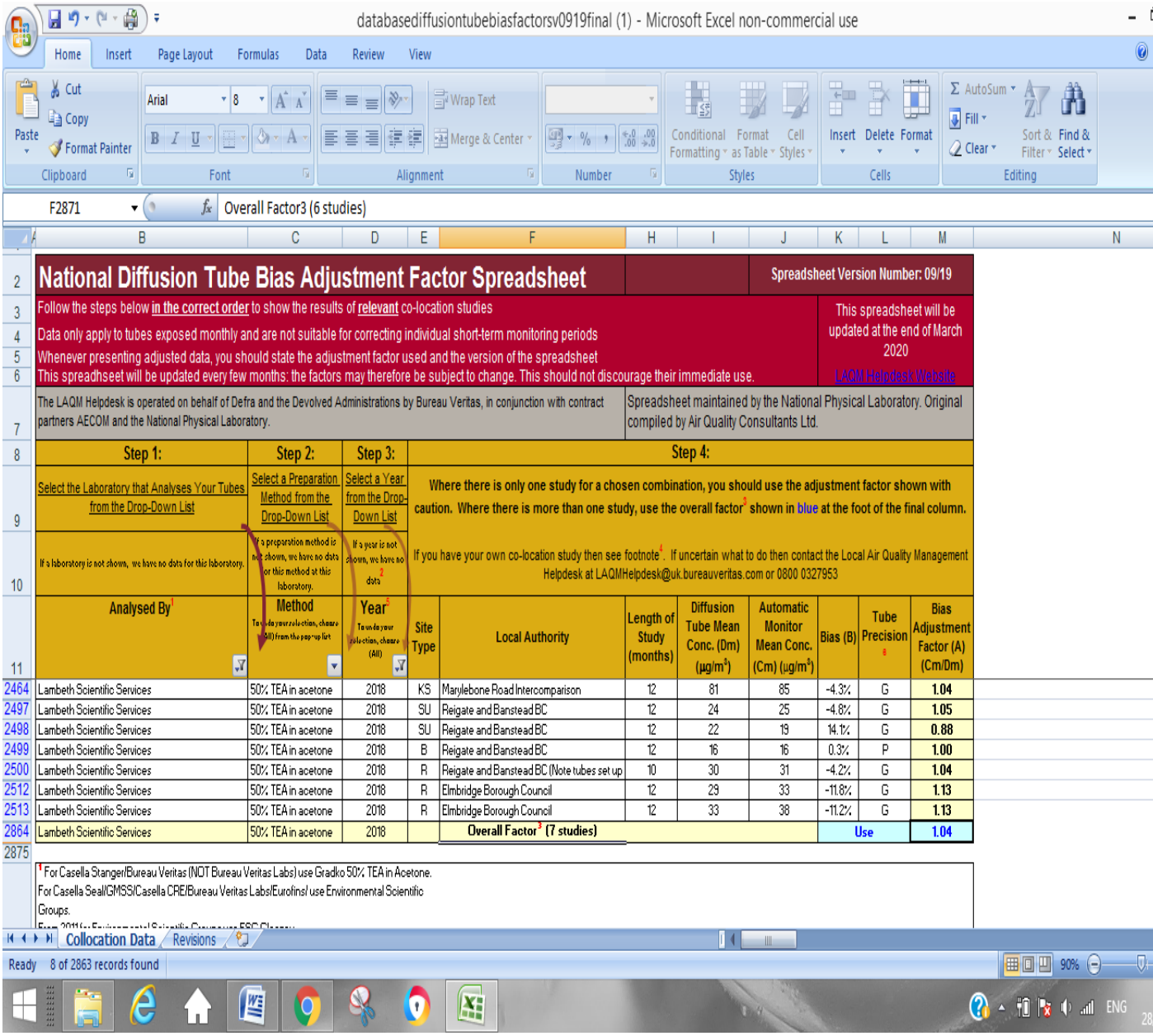
Table C.1 Diffusion Tube Bias Adjustment Factors, 2000-2016

Year	Bias Adjustment Factor
2000	0.97
2001	1.09
2002	1.15
2003	1.05
2004	1.19
2005	1.24
2006	1.28
2007	1.07
2008	0.98
2009	1.03
2010	1.06
2011	1.06
2012	0.87
2013	0.83
2014	0.89
2015	0.97
2016	0.95
2017	0.93
2018	1.04

Bias correction factor 2018 = 1.04

Considerations used for the selection of 2018 bias correction factor;-

Figure C.1 -Screenshot of national website bias correction factors



databasediffusiontubebiasfactorsv0919final (1) - Microsoft Excel non-commercial use

F2871 Overall Factor3 (6 studies)

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 09/19

Follow the steps below in the correct order to show the results of relevant co-location studies

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet

This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of March 2020

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

	Analysed By[1]	Method (To update your selection, choose (All) from the pop-up list)	Year[5] (To update your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
2464	Lambeth Scientific Services	50% TEA in acetone	2018	KS	Marylebone Road Intercomparison	12	81	85	-4.3%	G	1.04
2497	Lambeth Scientific Services	50% TEA in acetone	2018	SU	Reigate and Banstead BC	12	24	25	-4.8%	G	1.05
2498	Lambeth Scientific Services	50% TEA in acetone	2018	SU	Reigate and Banstead BC	12	22	19	14.1%	G	0.88
2499	Lambeth Scientific Services	50% TEA in acetone	2018	B	Reigate and Banstead BC	12	16	16	0.3%	P	1.00
2500	Lambeth Scientific Services	50% TEA in acetone	2018	R	Reigate and Banstead BC (Note tubes set up	10	30	31	-4.2%	G	1.04
2512	Lambeth Scientific Services	50% TEA in acetone	2018	R	Elmbridge Borough Council	12	29	33	-11.8%	G	1.13
2513	Lambeth Scientific Services	50% TEA in acetone	2018	R	Elmbridge Borough Council	12	33	38	-11.2%	G	1.13
2864	Lambeth Scientific Services	50% TEA in acetone	2018		Overall Factor[3] (7 studies)				Use		1.04

[1] For Casella Stanger/Bureau Veritas (NOT Bureau Veritas Labs) use Gradko 50% TEA in Acetone.
For Casella Seal/GMSS/Casella CRE/Bureau Veritas Labs/Eurofins/ use Environmental Scientific Groups.

Collocation Data | Revisions

Ready 8 of 2863 records found

Selection of a bias correction factor

Precision versus accuracy is detailed within DEFRA web site and it states "*where results show poor precision then they should be treated with caution and may not be suitable for their intended purpose. The aim should be to use results from tubes that are giving "good" precision as this will improve the overall reliability of the annual mean concentrations derived from the diffusion tubes*".

Hence in selecting the bias correction factor for 2018 then the best quality data is sought and hence only the sites which could provide "good" precision and have followed the required methodology were selected to work out a "robust" bias correction factor. ((NB good precision is where the coefficient of variance (CV) of multiple exposed tubes collated with a continuous monitor for eight or more period during the year is less than 20% and the average CV of all monitoring periods is less than 10%).

7 study results were posted on the website. 6 of the 7 studies were considered to have good precision. The one result which had poor precision reported a result of 1.00 and hence this figure did not detract from the stated average. Therefore, the resultant bias correction figure of 1.04 was selected as the most appropriate factor to be applied to the 2018 nitrogen dioxide results.

Annualisation

Annualisation in accordance with the technical guidance regarding the use of background reference diffusion tubes was undertaken on the diffusion tubes results which had less than 75% capture. (see spreadsheet of workings below)

	RY4 back	1	45	53	56	57	ry1	RY45	ry53	ry56	ry57
Jan	18	30		43	47	32	18		18	18	18
feb	18			31					18		
mar	22	36	40	34	52	41	22	22	22	22	22
apr	6			39					6		
may	19	23		25			19		19		
Jun	13	24		35			13		13		
Jul	16	33					16				
Aug	14		21			24		14			14
Sep	18	31	38		52		18	12		18	
oct	26	22	47	32	37	47	26	26	26	26	26
Nov	32		47	35	55	44		32	32	32	32
Dec	31	36	51		51	46	32	31		31	31
Av	19.4	29.4	40.7	34.2	49	39	20.5	22.8	19.3	24.5	23.8
							19.4/20.5	19.4/22.8	19.4/19.3	19.4/24.5	19.4/25.8
ratio							0.946341	0.85087719	1.008	0.79183673	0.751938
							0.95	0.85		0.8	0.75
							29.4 x0.95	40.7x 0.85	34.2 x1.008	49 x 0.8	39 x 0.75
res							27.93	34.595	34.5	38.71	29.25

ult											
							27.9 x1.04	34.6x1.04	34.5 x 1.04	38.7 x 1.04	29.3 x1.04
bias 1.04							29.0472	35.984	35.8	40.248	30.472
final							**29.1**	**36**	**35.8**	**40.2**	**30.5**

Spreadsheet of annualisation workings

Use of nationally posted bias correction factor.

Runnymede Borough Council is very much dependent on the national website to provide a justifiable bias correction factor to be applied to the diffusion tubes results. Since the last round of 3 posting events is in September, September normally being the time when the vast majority of respondents post their results on the national spreadsheet, it could be suggested that only after this point then there is a robust pool of results which can provide a reasonably suitable bias correction factor. Therefore, it becomes very difficult for local authorities who rely on this nationally sourced bias correction figure to be able to provide Defra with a validated ASR by June. It has been noted that there can be a significant difference in the bias correction over the course of the 3 rounds of submission to the bias correction website. Since these 3 rounds of posting data can produce significant difference in a bias correction values hence the accuracy of final report could therefore be affected. It would be good if there was an elegant solution to this potential lacuna.

QA/QC of diffusion tube monitoring

Nitrogen dioxide

Laboratory Performance and WASP scheme

Lambeth Scientific Services Limited follows the procedures set out in the Harmonisation Practical Guidance and participates in the WASP scheme operated by the Health and Safety Laboratory.

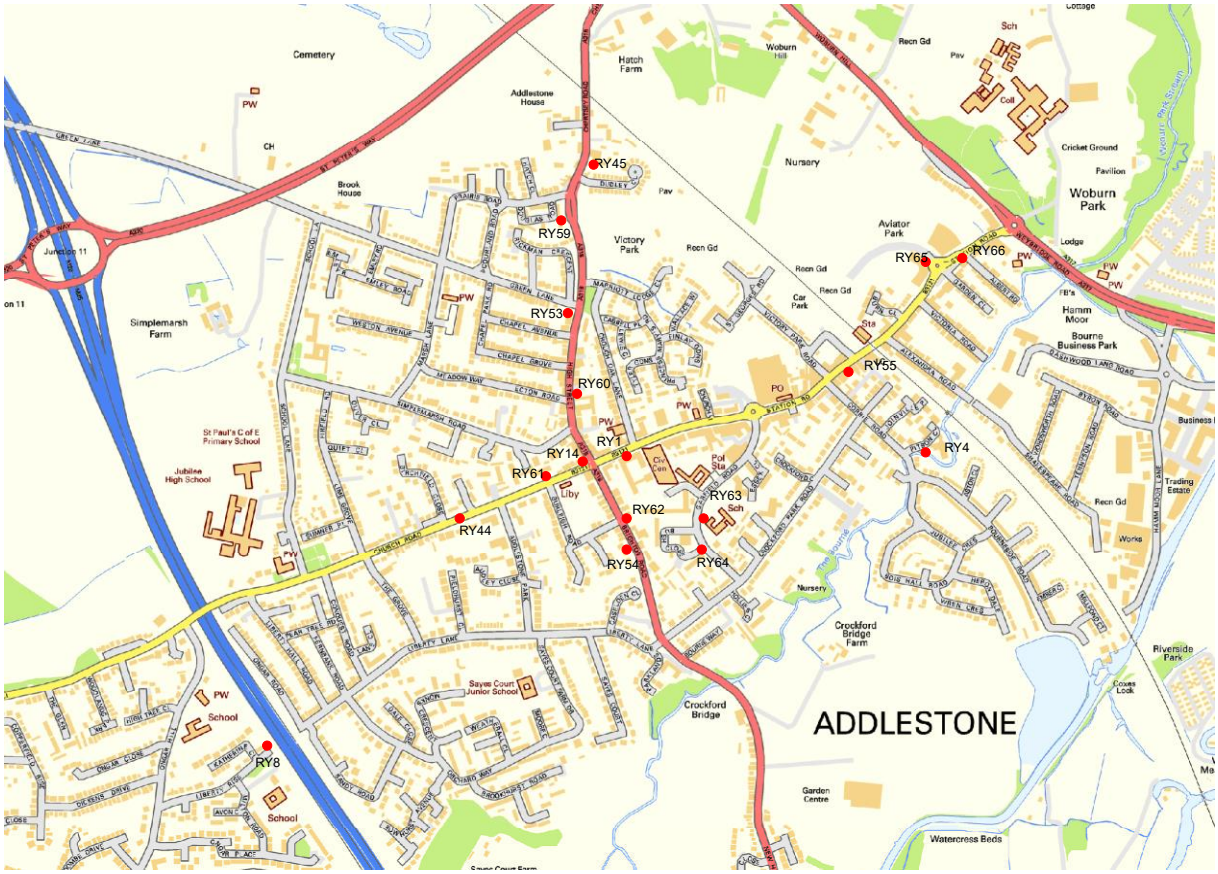
Nitrogen dioxide fall-off with distance

Use of DEFRAs on-line nitrogen dioxide fall-off with distance calculator – version v4.1 released April 2016.

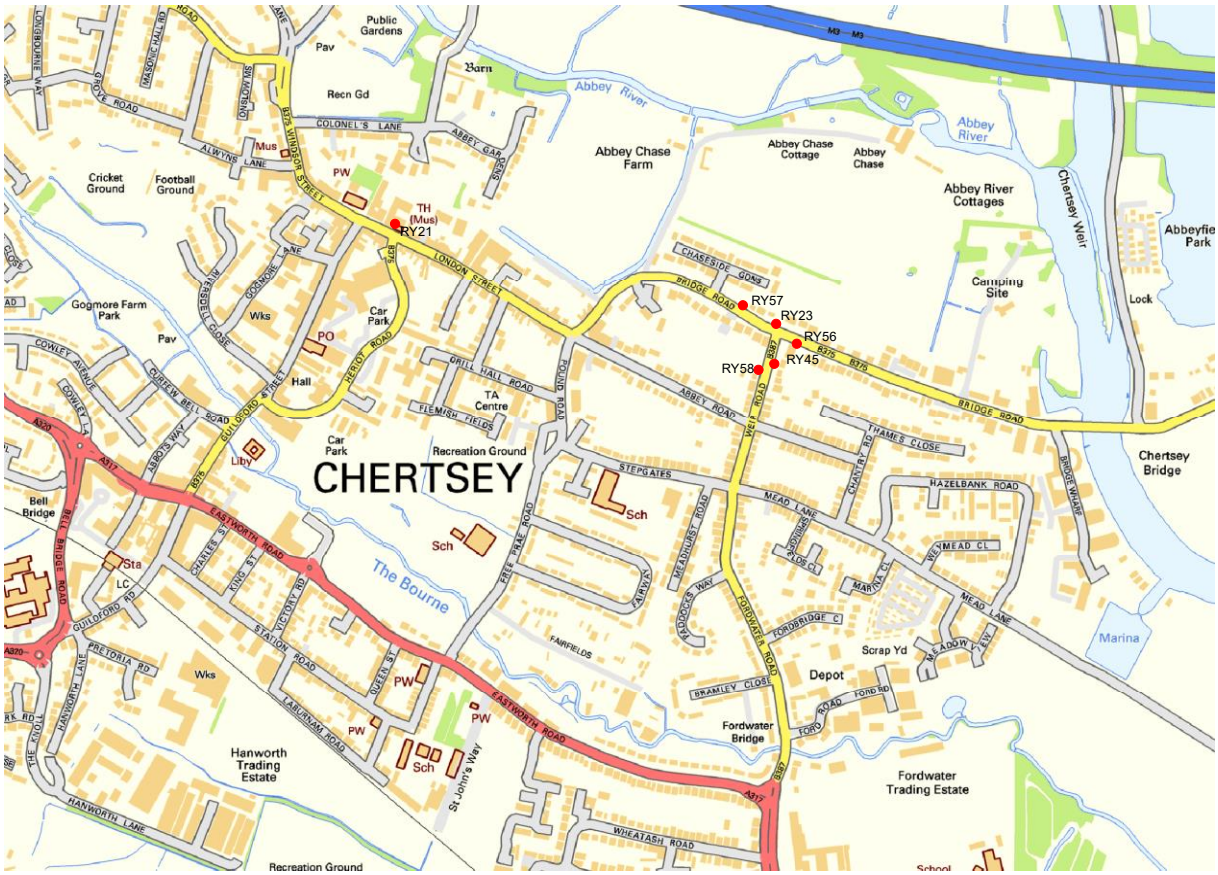
Appendix D: Map(s) of Monitoring Locations and AQMAs

Map of monitoring points in and around Addlestone AQMA

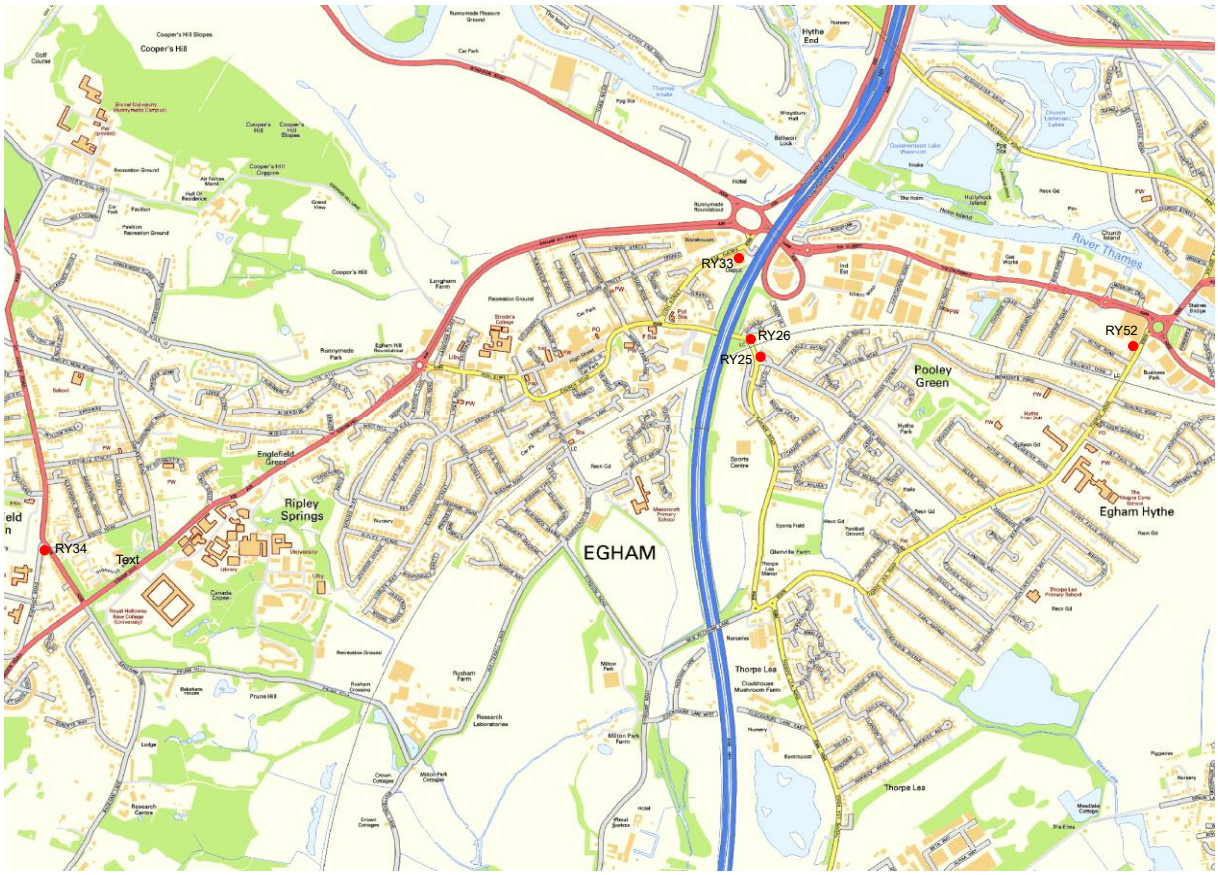
Monitoring sites located within Addlestone AQMA = RY1, RY14, RY54, RY60, RY62,



Map of monitoring locations at Weir Rd / Bridge Rd

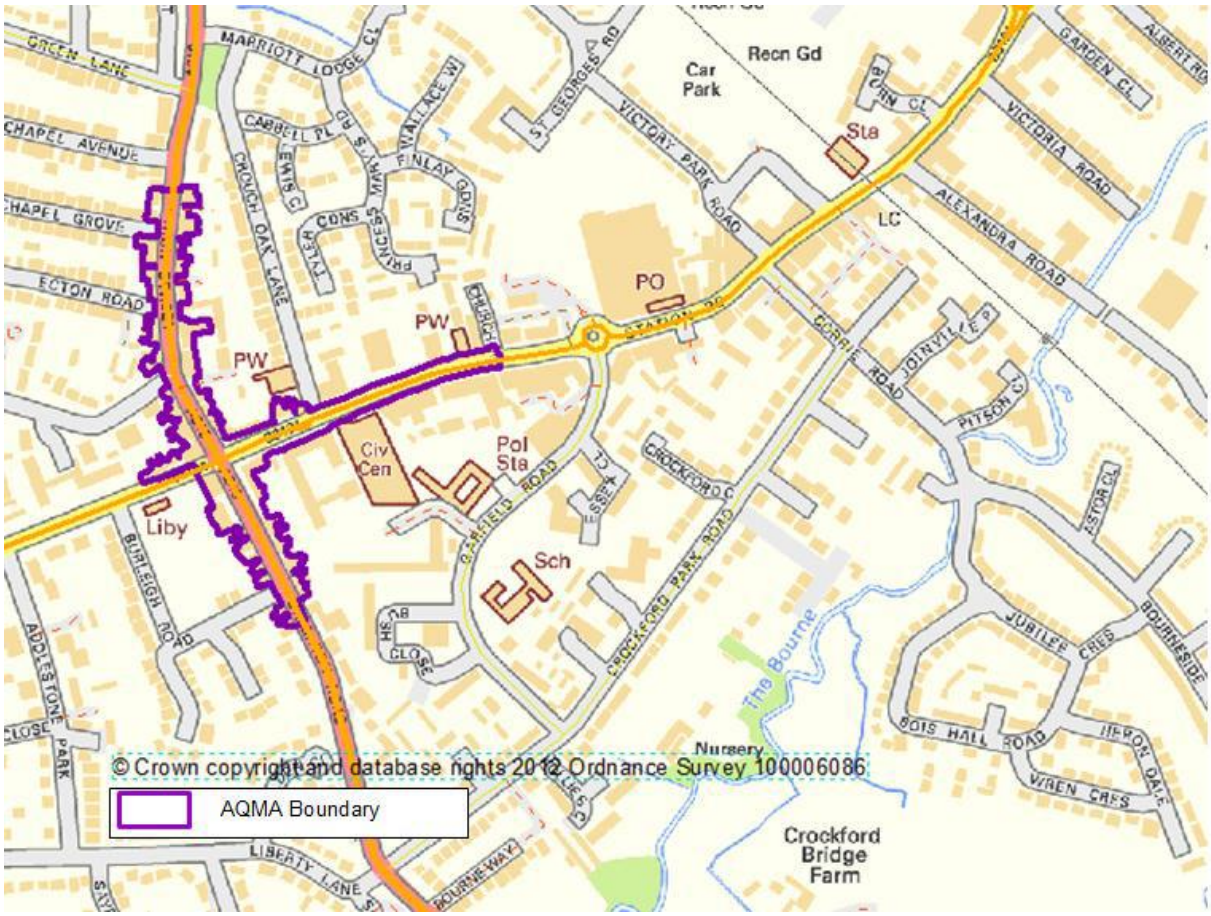


Monitoring sites located within M25(Egham) AQMA= RY25, RY26, RY33



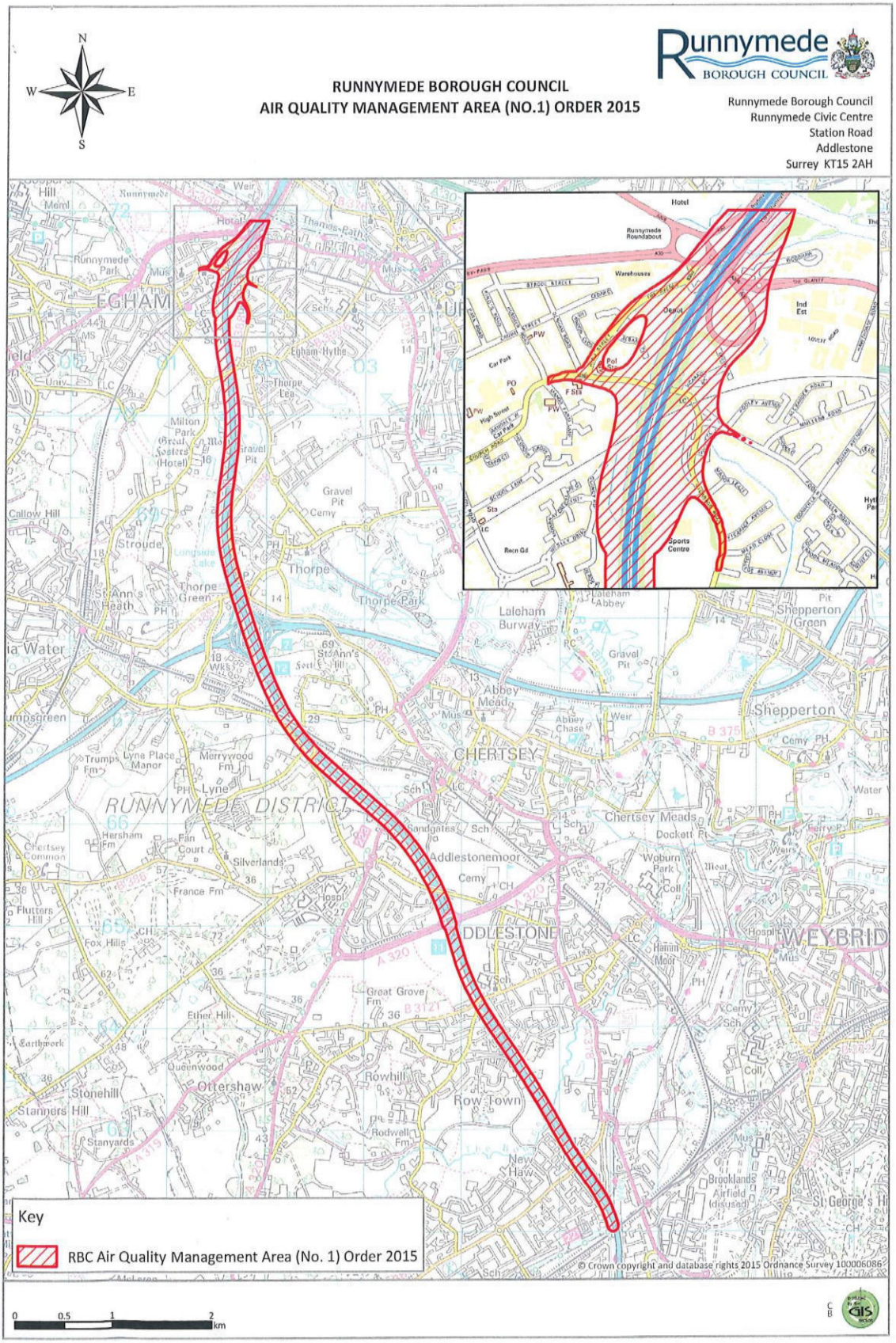
Maps of AQMA within Runnymede BC

Map of Addlestone AQMA



Monitoring sites located within Addlestone AQMA = RY1, RY14, RY54, RY60, RY62

M25 + Egham extension - AQMA



Appendix E:Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[1]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[1] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
SAA	Surrey Air Alliance

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